

EnviroNews

Updating environmental issues and activities at Hill Air Force Base, Utah

Fall/Winter 2001

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INSIDE

Fruit tree sampling produces surprising results

Editor's note: In October, Hill announced the initial results of fruit tree sampling conducted in Sunset and Clinton. A flyer explaining the results was mailed to residents in affected areas of Sunset and Clinton. The story was also reported in the news media, including a thorough article in the Ogden Standard Examiner. The purpose of this article is to provide information to those who did not receive a flyer and to update information to those who did.

Using newly developed techniques, scientists at Utah State University have detected trace amounts of trichloroethene (TCE) in fruit harvested from trees in and near areas of groundwater contamination in Sunset and Clinton. This marks the first time TCE has ever been detected in fruits and changes what scientists have thought about how chemicals like TCE behave in the environment.

These new techniques allow researchers to detect chemicals in fruit at much lower concentrations than what has previously been possible. Even with the new analysis methods, however, the amount of TCE in the fruit is too low for the laboratory instruments to provide an exact measurement.

Based on the estimates provided by USU, the

amount of TCE in the fruit does not pose an immediate public health threat. Toxicologists from the Utah Department of Environmental Quality and the Environmental Protection Agency, who have also seen the laboratory data, agree.

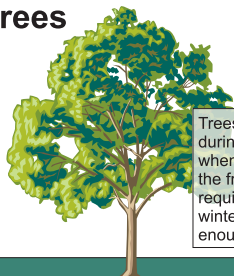
This news came as quite a surprise to Hill AFB scientists, as well as the scientists at Utah State. For years, the Air Force has been telling people what all the scientific literature has said—that TCE does not accumulate in fruit.

“This is what we’ve been telling people because to the best of our knowledge, that was the truth,” said Allan Dalpias, director of Environmental Management at Hill. “Now that we have new information, we are telling people what we know, as has always been our policy.”

What we know

- Traces of TCE were detected in fruits. Even with the difficulty of measuring the exact amount of TCE in the fruit, we do know it is there, albeit in very small amounts (part-per-billion levels). Future efforts will focus on determining the exact concentrations. (Conventional analysis techniques used by most laboratories would not have detected anything in the fruit.)
- This is the first time chemicals like TCE have ever been found in homegrown fruit.
- Some fruits, such as apples and plums, showed TCE when green, but showed no TCE when ripe.
- Fruit stored for more than a couple of weeks (such as in baskets or boxes) showed no TCE.
- Nearly all of the canned fruit samples analyzed showed no TCE. The exception was one bottle of pears, which showed 1 part per billion.
- Because of their shallow root systems, vegetables do not appear to be affected.

How chemicals get into trees



Trees use the most water during the spring and summer when the fruit is growing. Once the fruit has matured, the tree requires less water. During winter, the tree draws just enough water to stay alive.

Trees take up water where they can find it. Older trees have roots that can reach down to the shallow groundwater.

Chemicals in the groundwater can be drawn up through the roots and into the leaves and fruit.

In contaminated areas, the lowest chemical concentrations are at the top of the shallow groundwater.

Shallow Groundwater

Why test fruit?

At InfoFairs held last year, a number of people asked to have their fruit sampled. We tested the fruit in August and September. Canned fruit samples, along with samples of stored fresh fruit, were collected after the initial results were announced in October.

Can I eat my fruit?

According to our best data, we believe the fruit from your trees is safe to eat. Canned fruits, dried fruits or fruit stored in boxes or baskets are safe, as well.

Want to help?

If you have mature fruit trees and live in or near an area of groundwater contamination, you may be interested in participating in Utah State's expanded fruit study for the 2002 growing season. Please call Steve Hicken at (801) 775-3648 for more information.

What is a part per billion?

A part per billion means one part of something in a billion parts of something else. That equates to approximately one drop of water in a typical backyard swimming pool. 1 ppb is equal to 0.0000001 percent.

See "Fruit trees"
Continued on page 6

Hill's RAB

The Hill AFB Restoration Advisory Board was formed six years ago to ensure that all stakeholders in the Air Force's cleanup have a voice and can actively participate in the decision-making process. RAB members are asked to review and provide input on budgets and spending, cleanup documents, schedules, plans and investigations and associated reports.

New selection procedures

The RAB changed its procedures for selecting community at-large representatives when they completed a review of their Mission Statement and Operating Procedures in June. In the past, volunteers for community at-large positions filled out applications and the city government would select the representative. The RAB now reviews the applications and selects the community at-large representatives for a two-year term of service.

Hill AFB Rep sought

Hill is currently seeking a community at-large representative from Hill AFB. This person can be anyone who works or lives at Hill. Anyone interested in serving can contact Charles Freeman at 775-6951.

Hill welcomes four new RAB members

Residents with questions about Hill AFB's groundwater cleanup program have four new fellow residents to turn to for answers. The four—Dale Searcy and Rita Painter from Roy; Greg Fisher, Clinton; and Julia Heavirland, West Point—are the newest members of the Hill AFB Restoration Advisory Board (RAB).

The RAB is a group of citizen volunteers, city government and other agency representatives who meet at least quarterly with the Air Force to discuss and monitor the environmental cleanup under way on the base and in seven local communities. Each city affected by Hill AFB's environmental program is represented on the RAB and also has a community at-large position on the board.

Searcy works for Roy City and was selected by the city to serve as its representative on the RAB. Painter filled out one of 1,200 application that were mailed to Roy residents. She was selected by the Roy City Council to serve as the Roy Community At-large representative on the RAB.

Both have attended the last few RAB meetings and the two InfoFairs held in November for residents of Clinton, Sunset and Roy. Searcy said from what he has seen through the RAB and the InfoFairs, the work the Air Force has under way in Roy and the other communities is going in a good direction.

"(The Air Force) is trying to take care of the problem...and is making sure that what they do is the right thing to do," Searcy said. "They are keeping people informed and making sure they get taken care of."

He said that most residents he has talked with at the InfoFairs and Roy City Council meetings know he and Painter represent them on the RAB. "They know we look at things differently than Hill Field does," he said. "So, they'll ask Rita and myself questions just to see how we feel compared to what they were told by the Hill Field representatives." He said he's able to let residents know that the Air Force representatives "are really straight forward in keeping us informed."

"I think that gives people a lot of comfort (to know the problem) is being taken care of and



Rita Painter



Dale Searcy

they're not in harm's way right now," Searcy said.

Painter, who has lived in the area for about 45 years, said her experience with the RAB has taught her that "we should be more cautious" about taking care of the environment. She describes her role on the RAB as that of an observer. "I observe and report back (to Roy residents) what I learn," she said.

Fisher said he sees his role on the RAB as the "eyes and ears" of Clinton residents to make information available to them. He learned about the RAB when he attended an InfoFair earlier this year. He said the InfoFairs are a good way to get information out to residents, and he and Heavirland were available during November's InfoFairs to answer resident questions.

"The InfoFairs are very informative," he said, "and a good chance to learn other people's viewpoints and get a lot of the technical information. I wish more people would attend."

Although West Point is not affected by groundwater contamination from Hill AFB, Heavirland filled out an application to become part of the RAB. "I am very interested in environmental issues of the area," she explained on the application. She is a retired Air Force lieutenant colonel who also has a degree in biology and has taken courses in ecology and environmental systems.

To contact any of the RAB members, please check our website at www.em.hill.af.mil. There you will find information about the RAB, including minutes from past meetings and a listing of RAB members. If you don't have internet access, please call Charles Freeman at 775-6951 and he can provide you the information you need.

CleanUpdate

Cleanup news from the communities surrounding Hill AFB.

Roy groundwater plume becomes Operable Unit 12

Groundwater contamination in Roy will now be cleaned up under its own Operable Unit. OU-12, will include the contaminated groundwater in Roy and its source area on base. (See story on page 2 for an update on the Roy investigation.)

The Roy contamination had been part of Operable Unit 5, which also included contaminated groundwater in Sunset and Clinton. Separating the Roy contamination from OU-5 allows the investigation and cleanup to proceed on its own schedule.

"This is good for both Operable Units," said Steve Hicken, investigations program manager at Hill. "The investigations and cleanup work can continue without delays in one area affecting work at another."

Mark Loucks, who also manages OU-5, will continue as project manager at OU-12. He can be reached at 777-6299.

Layton Remedial Investigation due out in January

On January 10, 2002, Hill AFB will release the Remedial Investigation Report for Operable Unit 8 for public review. The document will be available at the eRepository at the Weber State University Library, or at the Environmental Management Directorate offices in Bldg. 5. An executive summary of the document will be available at EM's website at <http://em.hill.af.mil/restoration/documents/OU8RI/execssummary.html>.

The RI report includes a detailed description of the groundwater contamination on the southern end of the base and in Layton.

In addition, a Baseline Risk Assessment will also be released as part of the RI report. The Risk Assessment is a comprehensive evaluation of the po-

tential risks the contamination poses to people and the environment. See the next issue of EnviroNews for more details on the findings of the RI report and the Baseline Risk Assessment.

Progress at OU6

In Riverdale, data collected over the last several years indicate a dramatic decrease in groundwater flow into a small groundwater collection system located in the Craigdale subdivision. This decrease in flow corresponds directly to a decrease in TCE concentrations.

Flows into the system have decreased from an average of 98,000 gallons per month to just 201 gallons per month. Concentrations of TCE in the garage sump water have also dropped from nearly 39 parts per billion (ppb) to less than 3 ppb.

The system collects groundwater from a seep that exists along the hillside on private property.

Air Force officials believe the decrease in flow is due to a number of factors, including the recent installation of a groundwater extraction system at the base boundary and the piping of the Davis-Weber canal back in 1999.

"We're thrilled to see these results," said Jeff Watkins, who manages the operations of all Hill's treatment systems. "If the current trend continues, this treatment system may no longer be needed," he said.

Deactivating any treatment system must have approval from the Utah Department of Environmental Quality and the Environmental Protection Agency. In addition, the Air Force would continue to monitor the site and reactivate the system if changing site conditions warrant it.

For more information about this or any existing treatment system on or off base, contact Jeff Watkins at 775-6910.

EnviroNews

EnviroNews is a quarterly publication of the Environmental Management Directorate, Hill AFB, Utah, designed to inform the public of hazardous waste cleanup and other environmental activities at Hill AFB.

Contents of EnviroNews are not necessarily the official view of, or endorsed by, the U.S. Government, the Department of Defense, the U.S. Air Force, or its contractors.

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Source of Roy contamination

The Air Force believes it has located the source of the groundwater contamination in Roy. It appears to be coming from the vicinity of an old wastewater treatment plant. According to historical records, this plant operated in the 1940s and received liquid wastes from the entire Ogden Arsenal. While waste solvents may not have been in the wastestream, they were probably dumped or buried in trenches adjacent to the plant. The Air Force has determined that the Roy contamination is not linked to nearby groundwater contamination in Sunset and Clinton.

Roy RAB representatives

Roy has two representatives on Hill's Restoration Advisory Board. Rita Painter, represents the citizens of Roy and Dale Searcy represents Roy City's interests. If you have questions or concerns, Ms. Painter can be reached at 603-0133 and Mr. Searcy can be reached at the Roy City public works department at 774-1090.

AF Points of Contact

For more information about environmental activities at Operable Unit 12, please contact Mark Loucks (777-6299) or Steve Hicken (775-3648).

Hill's hustle tracks down Roy contamination quickly

After just two years of investigation, the Air Force believes it has defined the area of shallow groundwater contamination in Roy. This completes the first step in preparing a plan to clean up contaminated groundwater in Roy.

Contamination was first discovered in Roy in 1999. Since then, Air Force contractors have been very busy, taking groundwater samples from more than 150 locations and installing 26 permanent monitoring wells in the streets. With the data gathered from this effort, the Air Force has been able to define an area of contamination stretching more than 1.5 miles from the base's western border.

According to Hill officials, this is a tremendous accomplishment in a remarkably short period of time.

"We have made significant progress in eliminating delays in the investigation process, which has resulted in the near completion of this investigation in record time," said Bob Elliott, Hill's Restoration Division chief. "With the progress we've made, we

will now be able to have an interim treatment system operating within the time it usually takes to complete an investigation of this type," Elliott said.

As with other areas of contamination around the base, the chemicals have not affected drinking water supplies, nor are they expected to.

"We're fairly confident we have found the edges of the plume," said Mark Loucks, an Air Force hydrogeologist and project manager for Operable Unit 12. "It looks a lot different than we thought it would when we first started out."

In fact, after the first few months of the investigation, geologists had found a narrow band of contaminated groundwater, moving through an ancient underground riverbed. Based on the geologic conditions found in the early months of the investigation, geologists initially estimated the contamination may stretch more than three miles into Roy.

"Our initial assumption was that the contaminated groundwater continued out to the west, maybe even as far as 3500 West," Loucks said. "So we kept looking toward the west a couple of streets at a time.

Then, just west of the abandoned railroad tracks (at about 2900 West), the trail of contaminated groundwater disappeared, as did the underground channel carrying the contaminants. This came as quite a surprise to Loucks and his team.

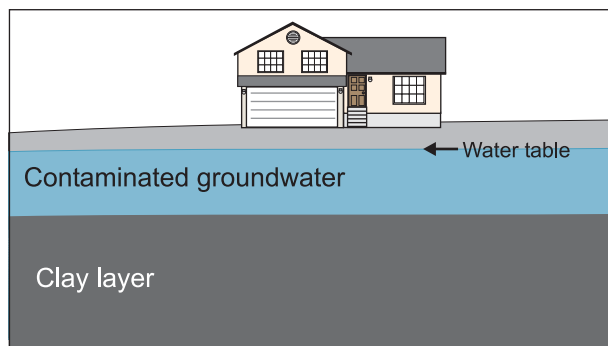
"We first thought maybe it had taken a left turn (to the south) on us," said Loucks. "But when we began putting holes in the ground south of the plume, we found nothing."

These "holes" referred to by Loucks are the monitoring devices used by Hill AFB to locate contaminated groundwater. Hill uses two methods. The first is called direct-push sampling, also called "hydro-punch" or cone penetrometer testing (CPT). This method uses a large truck to push a steel rod into the ground. A special tip at the end of the rod collects a sample of groundwater for analysis. Direct push samples can usually be taken in less than two hours. Direct push sampling allows geologists to quickly determine if contamination is present.

Monitoring wells are permanent monitoring points used to take groundwater samples over a long period of time. Once installed, a monitoring



Crews use a drill rig to install a monitoring well in a Roy street. Twenty-eight monitoring wells were installed in Roy this past summer to define the area of groundwater contamination in the city, and more will be installed.



West of railroad tracks

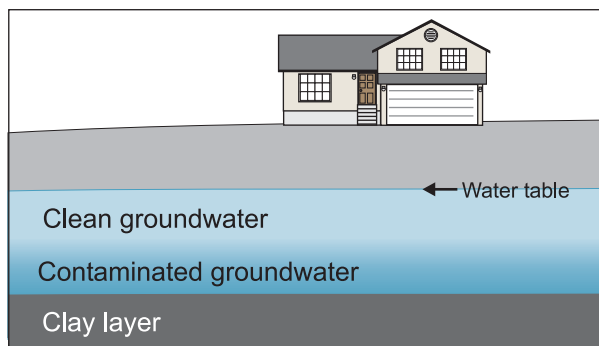
Within the OU-12 plume, how deep the chemicals are depends on where you are. East of the railroad tracks (at about 2500 West), groundwater is relatively deep, with a clean layer of groundwater at the water table. However, west of the tracks, the topography drops off sharply, bringing the surface closer to the water table. In this area, there is no layer of clean water at the water table.

well can be sampled resampled indefinitely. Wells are expensive to install and take several weeks to complete. Monitoring wells are usually placed in contaminated areas originally identified using direct-push sampling.

Using a combination of direct-push samples and monitoring wells, geologists believe they have found the end of the of the chemical plume. Based on the data collected, they also believe they know why the contamination does not stretch out as far as originally thought.

“Just west of the railroad tracks we see a significant change in the geology,” Loucks said. “The soils are much finer, which means the groundwater flows through it much slower.”

Loucks added that not only does water move more slowly through finer-grained soil, but dissolved con-



East of railroad tracks

taminants in the water move even slower.

Geologists found another significant geologic change west of the railroad tracks—the groundwater is much closer to the surface.

“East of the tracks, the water table is relatively deep, ranging from 20 to 40 feet, depending on where you are,” Loucks said. “In the area of contamination, the chemicals are deeper still, with a zone of clean groundwater sitting at the top of the water table,” he said.

“However, as the contamination extends west of the tracks, the layer of clean water at the top of the water table goes away,” Loucks said.

Loucks said more monitoring wells will be installed in the coming months to better define the area of contamination, including how contaminants are distributed in the shallow aquifer.

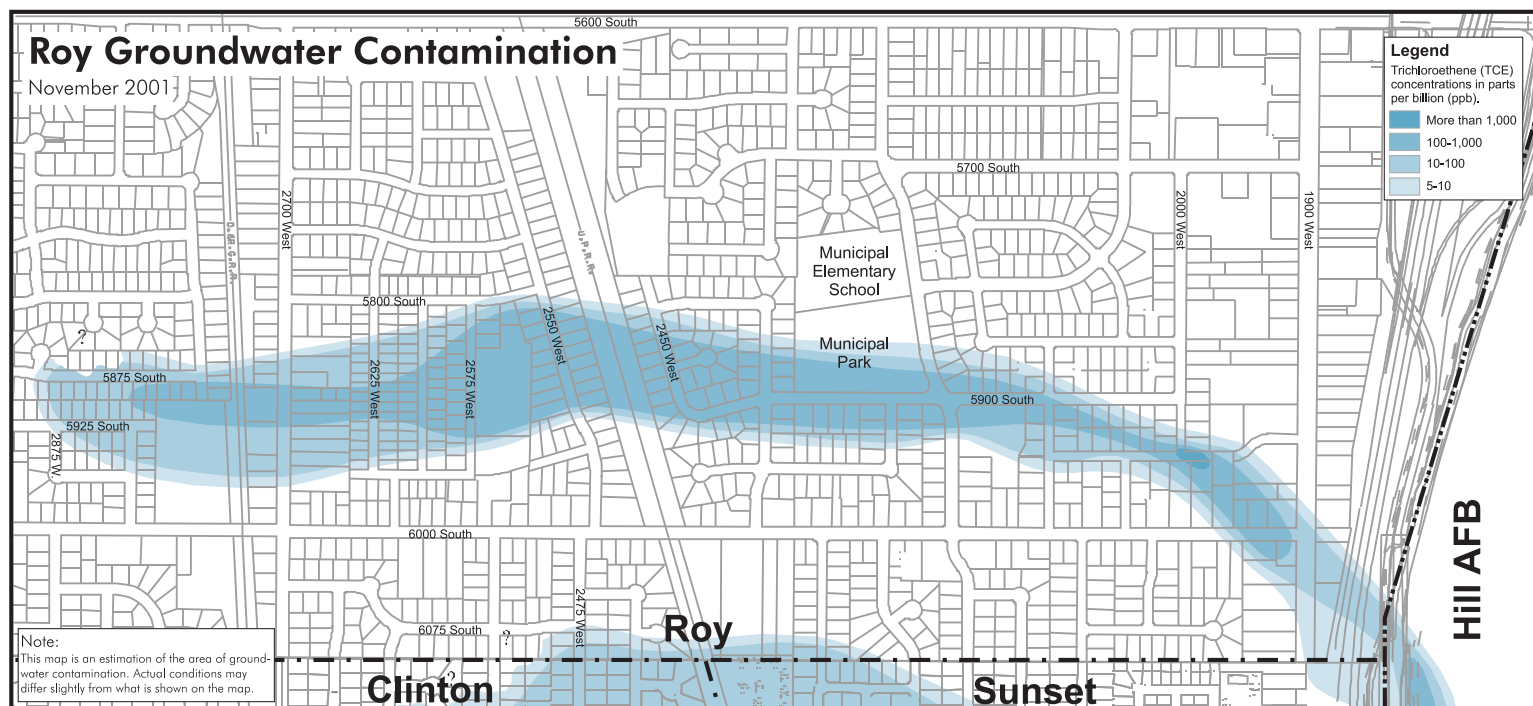
Groundwater movement

Geologists use a mathematical formula to determine how fast groundwater moves through the soil. Groundwater moves fastest through loosely packed soils and slowest through densely packed soils. Chemicals like TCE typically do not move as fast as the groundwater.

Groundwater in this area flows between 150 and 350 feet per year. That’s less than one foot per day.

Cleanup plans underway

The Air Force is already in the process of evaluating potential options for an interim cleanup system. A proposal should be ready for public comment in 2002, with the system beginning operations about a year later.



Official Business**Fruit trees***Continued from front page***What we don't know**

- We don't know the exact amount of TCE in the fruit, but we know it is very low.
- Unlike drinking water, there is no government standard or guideline that regulates how much TCE fruit can have in it and still be safe to eat. We can estimate, based on the amount of TCE measured in the fruit, how much fruit one would have to eat to be at risk from the chemicals.

What does all this mean?

Your fruit is safe to eat. Our data have been analyzed by scientists and compared to the risk standards set by the EPA. According to our estimates, a person would have to eat more than 900 pieces of freshly picked fruit every year for 30 years to increase their chances of contracting cancer by 0.00001 percent, the level at which EPA considers a risk to be significant. Furthermore, since the harvest season lasts only a few weeks, there is a limited window of opportunity to eat those 900-plus pieces of freshly picked fruit, the type of fruit that showed the highest concentrations of TCE.

"There are still a number of questions we would like to have answered," Dalpias said. "The study

already underway for next growing season is designed to provide us the answers we're looking for. As soon as the information becomes available, we will provide it to the community."

What is TCE?

Trichloroethene, or TCE, is a common solvent that was used at Hill in the 1960s and 1970s.

TCE was routinely disposed of by dumping into pits or on the ground. Those practices ceased when environmental regulations came into effect in the mid- to late-1970s. Widespread use of TCE was stopped at Hill in 1976. TCE is still available in some commercial degreasing products.

There is much debate in the scientific community about the toxicity of TCE. Some studies suggest that long-term exposure to TCE causes cancer. Other studies suggest it does not. Most of what we know about TCE comes from studies on mice and rats. There are very few human studies that have been done. More human studies are underway. The hope is that in a few years, there will be some conclusive data on the toxicity of TCE.

**Come visit us on the web!**

Find out more about Hill AFB's environmental programs by logging on to

www.em.hill.af.mil

Why "freshly picked" fruit?

It appears that freshly picked fruit contains the highest levels of the chemicals. We believe this is because the chemicals begin to escape the fruit as soon as it is removed from the tree. Samples of stored fruit showed no TCE. Next year's study should give us more details.

Upcoming InfoFairs

In November, we held InfoFairs in Sunset and Roy. We plan additional InfoFairs in the coming months for residents of Riverdale, South Weber and Layton. Affected residents will be notified of the date, time and location of these forums.